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MARSHALL STAR

Serving the Marshall Space Flight Center Community

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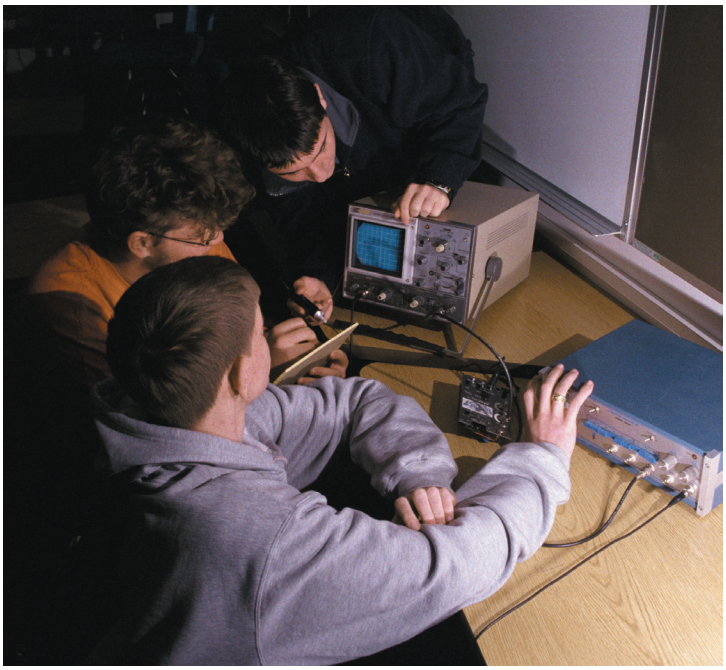

Student engineers at North Pole High School in North Pole, Alaska, run diagnostic tests on a radio receiver they installed on their school roof in January. Their work will enable NASA scientists at the National Space Science and Technology Center in Huntsville to stream audible "Earth music" emitted by the aurora borealis and other natural phenomena across the Internet.

Alaskan students help NASA study 'Earth music'

By Rick Smith

In the tiny town of North Pole, Alaska, the sun currently creeps into view for just three or four hours a day. Temperatures typically crash in February to minus-30 degrees Fahrenheit or lower. And bears aren't uncommon in these parts -- mother grizzlies have on occasion sheltered their cubs in the woods near the local high school.

But none of that can chill the enthusiasm of North Pole High School math teacher Dr. Curt Szuberla and his student team of aspiring scientists and engineers, who braved the elements this winter on NASA's behalf to scout locations for and build a very-low-frequency radio receiver, or VLF.

The receiver will help NASA and students around the nation study the eerie "music" of planet Earth -- radio waves emitted by lightning strikes and other natural phenomena, which VLF receivers deliver as a weirdly beautiful chorus.

VLF receiver systems are simple gadgets, little more than an antenna and an audio amplifier, which translate radio waves -- inaudible to humans -- into acoustic oscillations we can hear. In 1990, space scientist Bill Taylor of NASA's Goddard Space Center in Greenbelt, Md., and Bill Pine, an enterprising science

See Earth music on page 3

Pearson

Pearson helps ensure further space exploration

By Sheri Bechtel

Dallias Pearson has spent his career launching big vessels, first in the U.S. Navy and then in the U.S. space program.

Pearson is a technical assistant in the Automated Systems and Automated Rendezvous and Docking Division of the Engineering Directorate at NASA's Marshall Center. He is gearing up to play a key role in one of NASA's most exciting ventures, further exploration of our solar system. Pearson's office is responsible for ensuring space transportation systems' technology is properly designed, developed and flight-ready.

"This is an exciting time and opportunity for us; one that could shape how we explore other planets in the solar system, as we move forward with the Vision for Space Exploration," Pearson said.

Pearson is responsible for vehicle avionics system analysis and software power systems for such NASA spacecraft as the Demonstration of Autonomous Rendezvous Technology (DART).

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Chitwood: Change can be beneficial

Deputy Around-the-Corner

Photo by Doug Stoffer/ Marshall Center

Marshall Center Deputy Director Charles Chitwood

I want to thank all who came to the Marshall Association Luncheon on Feb. 3. It was another nice welcome to the Center, and I look forward to attending future gatherings. For those who missed the speech, I would like to give a short summary, focusing mainly on adapting to change and validating how change is constant in our endeavors.

Regarding my speech, a number of you have either sent emails or other messages about the embedded von Braun remarks that I included. Thank you for your correspondence and positive comments. Because I didn't want you to know that an excerpt was borrowed from the late Dr. von Braun, I purposely changed a few of his words to make it gender-neutral. I also removed a few words that would have immediately pinpointed to that era. So with that in mind, let me share my thoughts.

The Agency is undergoing transformation and changes are being made. Our primary focus is returning the Shuttle to safe flight and preparing Marshall to be customer-focused and business-minded. My encouragement to you on Feb. 3 was to look at the current and future changes as a means of getting better. Change and adapting to it can be difficult. However, if we take hold and use the Stockdale Paradox, something Dave and I both have mentioned in public several times, we will come to the realization that change has a purpose. It will benefit NASA and ultimately the American taxpayer.

I believe that dealing with change begins with rather straightforward, if not simple, personal tasks. First, it's important to recognize that our attitudes are choices. We can choose our attitudes toward anything. Second, accept that change involves disruption, overreactions and mistakes. No individual or organization goes through significant change without some upheaval. And third, recognize and acknowledge that upheaval and moments of chaos are nothing special, they're just unfamiliar.

NASA is different today. Marshall is different. The Center's transformation will prepare us for the Vision for Space Exploration, *and* to operate in a business-like fashion.

Today, we must become a template for great management, while at the same time deal with change and capture future work. The demands for creative management Marshall faced in 1962 are similar to what we face today. The following is the excerpt from Dr. von Braun's speech on management. It is applicable to today's Marshall. Bold type has been added to denote changes.

It is the greatest manager of all who can keep reasonable peace in the family after he **or she** *has split all the annual resources among all the department heads…each of whom knows positively and absolutely that if he* **or she** *gets one fewer person or one*

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Engineer

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DART is a flight demonstrator providing a key step in establishing automated human-free rendezvous capabilities through the use of onboard computers and sensors.

Pearson's projects also include the Orbital Express, scheduled for flight during 2006 and ground-level research to support development of the Crew Exploration Vehicle (CEV). The CEV is part of NASA's Project Constellation. The project is developing the next generation of space vehicles that will send humans to the moon, Mars and beyond.

Before arriving at NASA, Pearson's career took an interesting turn. Eager to start working, he left college in his freshman year and moved to Boston to work at the Boston Naval Shipyard. He installed radar equipment and routed cable for electronics, power and weapons aboard Navy ships. But it was the work he did with a pen and paper, while at the shipyard, that helped him shape his career.

"My Navy responsibilities included drafting drawings for aircraft hardware," Pearson said. "It was fun work, and it helped me narrow down what I wanted to do with my life," he added.

Pearson returned to school and graduated in 1973 from the Tuskegee Institute with an electrical engineering degree. His first job was with SCI Systems, Inc., in Huntsville as a NASA contractor. For SCI, Pearson worked on his first Mars-related NASA mission, the Viking program. He designed part of the spacecraft's circuit system, including the plated wire memory bank on Viking 1 and 2.

Pearson joined NASA in 1974 as a civil servant. He worked as an electrical design engineer for the Marshall Science and Engineering Avionics Organization, which oversaw power distribution, power supplies and wiring harness design for spacecraft and launch vehicles.

Pearson moved to Marshall's Upper Stages Project Engineering Office in 1988, where he provided technical direction, planning and evaluation of the Space Shuttle and expendable payload stages. Among his office's accomplishments were eight successful missions, including: Mars Observer launched in 1992 to chart the planet's surface; Magellan launched in 1989 to study Venus; Galileo launched in 1989 to study Jupiter and its moons; and Ulysses launched in 1990 to study the sun's north and south poles.

Pearson has served in managerial and leadership positions at Marshall. In 2001, he was named deputy manager of the Space Transportation Directorate's Program Planning and Development Office. From 2003-2004, he was manager of the office and led the continued development of expendable launch vehicles.

The writer, an ASRI employee, supports the Public Affairs Office.

Return to Flight update

Workers at Kennedy Space Center in Florida used an overhead crane last week to move Node 2 – the second of three connectors between International Space Station modules – in preparation for its element leak test, a major milestone in processing the hub module for launch. Node 2 was moved from the Space Station Processing Facility, where it is being prepared for flight, to the Operations & Checkout Building, where it was tested in a large vacuum chamber.

Node 2 is more than 20 feet long and 14.5 feet wide, and weighs approximately 30,000 pounds. NASA's Marshall Center coordinates the day-to-day technical activities necessary for integration of the Node 2 systems and preparing this "utility hub" for flight. Once on orbit, it will make the Space Station roomier, permitting attachment of the Japanese and European laboratories that will expand the orbiting facility's useable space from that of a typical three-bedroom house to that of a five-bedroom house. These labs – which will be used for science research, and are expected to reach the Space Station in 2007 – are part of the joint effort of NASA and 15 other international partners to build the orbiting complex.

After the testing was successfully completed, Node 2 was returned to the Space Station Processing Facility to continue being readied for a December 2006 launch to the Station aboard the Space Shuttle.

Photo by Emmett Given/ Marshall Center

Youth leadership team visits Marshall

High school sophomores from around Madison County visited the Marshall Center last week as part of their leadership development training. The students saw the Shuttle Launch Experience, a movie exhibit, and participated in exercises, such as the one above, that taught them to challenge traditional processes.

Earth music

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teacher at Chaffey High School in Ontario, Calif., founded the Interactive NASA Space Physics Ionosphere Radio Experiments program, or INSPIRE, which uses these receivers to bring the excitement of studying very-low-frequency radio waves into the classroom.

INSPIRE, a non-profit education program managed at the Goddard Center, encourages students to build and activate VLF receiver systems and develop their own research projects. To date, more than 1,500 receivers have been built at elementary schools and high schools across North America. But none as far north as North Pole, Alaska.

Enter Szuberla, who holds a doctorate in physics, and his quartet of field researchers, 16-year-olds Kit Dawson and Matt Welch and 17-year-olds Matt Keller and Nicolas Leland -- all juniors studying calculus and advanced computer programming.

Szuberla, in consultation with NASA researchers Jim Spann, Mitzi Adams and Dennis Gallagher of the Marshall Center recognized a unique opportunity to use the INSPIRE concept in a new way -- bringing the hunt for ghostly Earth music to a whole new generation of students.

Earth's protective magnetic field is familiar to most people, but perhaps less well known is the way it expands around the planet's equator and converges at the North and South Poles. "Space weather" -- activity on the Sun such as solar flares and coronal mass ejections, which can change the interplanetary magnetic field and cause dazzling auroral light displays and other disturbances in Earth's own magnetic field -- make the polar regions more favorable sites for VLF systems to pick up natural Earth sounds.

At the "top" of the world, Szuberla's team also will record the low-frequency music of another natural phenomenon -- the aurora borealis -- and stream it via the Internet to the entire INSPIRE community, and to classrooms and Web users worldwide.

For Szuberla's students, that meant finding an ideal site for the VLF system and building the equipment. Wary of uncertain local terrain that could block or muffle radio waves -- and equally wary of bears -- the team settled on the school roof. To construct the VLF system itself, they traveled to the University of Alaska in nearby Fairbanks to learn how to solder transistors and other miniature components to build the receiver.

"Assembling the receiver really helped me understand some of the work in our classes," Keller said. "It definitely reinforced my interest in working with computers."

Szuberla enjoys their enthusiasm. "Right now, they're primarily interested in what goes into the box," he said. "In the spring, they'll learn what comes out of it."

The team will test their apparatus during the spring term, sending audio to Spann and his colleagues at the Marshall Center for verification of a clean signal.

In the fall of 2005, the Marshall Center's Space Science branch at the National Space Science and Technology Center will initiate a Web-based "Earthsounds Scavenger Hunt" program. The three-year education initiative, based on INSPIRE, will challenge students nationwide to use VLFs to "hunt" for natural Earthsounds -- sparking their interest in science and space.

The writer, an ASRI employee, supports the Public Affairs Office.

High schoolers prepare for Student Launch Initiative

Lee High School students participate in a critical design review in 2004 as they prepare for the NASA Student Launch Initiative.

By Jack Robertson

High school teams from California to Virginia are hard at work on their own plans for space travel. But instead of a journey to the Moon or Mars in the near future, these students are designing rockets they will build and launch toward the heavens this spring.

Today's "rocket boys" and "rocket girls" are getting a hands-on challenge through the Student Launch Initiative -- an education program that gives high school students practical experience in aerospace and engineering activities. NASA's Marshall Center manages the national competition, and the Arnold Engineering Development Center at Arnold Air Force Base in Tullahoma, Tenn., co-sponsors the event.

Participating in the competition this year are six new teams and four returning teams from the 2004 event. Teams from the Huntsville area are: Athens Bible School in Athens and Lee High School in Huntsville.

Student teams demonstrate proof of concept -- that their rocket design is feasible and will perform as intended. They design and build their own rocket, and develop a Web site to hold an on-line journal of their progress. Students can solicit advice and guidance from engineers in government, business and academia during the design and testing phases. In the course of this experience, they learn problem-solving skills, how to present financial proposals and how to budget.

Their vehicle must carry a science payload weighing between one-quarter and one-half-pound and reach an altitude of one mile. The rocket and the payload must be recoverable, contain a tracking device and be reusable. The team must collect data from the payload, analyze it and report the results.

NASA engineers and scientists will evaluate each rocket design, including propulsion, materials, payload and safety features. They also will look at the target altitude, formal reviews and Web site designs.

The writer, an ASRI employee, supports the Public Affairs Office.

Chitwood

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less dime than asked for, the whole program will immediately fall apart at the seams. This great manager is sort of like a **parent** *who has to divide five cherry tarts among eight children with every child in the bunch hollering for their share, whether they like cherries or not. I've seldom seen a department head yet – whether in industry, government, or* **academia** *– who wasn't desperate for more personnel, money, materials, maintenance, mathematicians, mind readers, magicians, and just plain miscellaneous. But still, somehow or other…sometimes thanks to good management and probably sometimes in spite of it…the boosters get built, the pads get erected, the spacecraft get designed, the instrumentation checks out, the* **launches** *are successful, and everything falls into orbit…as it should, or on occasion, falls flat on its face…as it should not. Why are we placing such emphasis these days on good management? Again, you know why. Because the job of placing a* crew *on* **other worlds** *and then returning* **them** *safely to Earth is…challenging. The technical complexities facing us are immense. But no matter how effective we might be in organizing the management of our program, we still must remain flexible. We must be able to give. Every day we learn something we didn't know. It is good to have all the facts in before you make a decision, but many times a good manager has to decide when* they *don't have all the facts at all.* **They** *may make a better decision because they can focus on the essential information. There is such a thing as cluttering up your mind with too much trivial information. There have been* **and will be** *changes in personnel, geographic locations, organizational structures, headquarters, projects and immediate objectives.* **But** *most important of all, our long range objective has remained the same – the continuous evolution of spaceflight. …Our basic management philosophy depends on the total effort of each individual as a member of a team…Human beings are complex and fascinating. No computer can solve our problems in human relations. No machine, no method, no management technique can substitute for a warm personal touch in dealing with human beings. The success of the team is a composite of the contributions each individual can…and will…make through* his or her *particular knowledge, experience, and skill. Each individual can be counted upon to do* **their** *best only if* **they** *feel that* **they are** *important and necessary in the total scheme of things. Cooperation cannot be commanded. Top management cannot operate from a lofty ivory tower, sending our directives, demanding 100 percent unquestioning obedience. One of the keys to management's success is its ability to communicate with all employees. This increased emphasis on communication is not only necessary, but creative.*

I'm hopeful that by sharing this excerpt, we will all have a better understanding of our environment as ever changing, yet not unfamiliar. We want to be a part of something important and inspiring. And, we can be by working together and continuing to transform to be better than ever.

Announcements

U.S. Sen. Richard Shelby to speak to Chamber group Monday

U.S. Sen. Richard Shelby will hold a Washington Update at 7:30 a.m. Monday in the Von Braun Center, North Hall. The event is sponsored by the Huntsville-Madison County Chamber of Commerce. Call Rosa Kilpatrick at 544-0042 for more information.

SE Software Engineering Conference is March 28-31

The fourth annual Southeastern Software Engineering Conference will be March 28-31 at the Von Braun Center. The event is an opportunity to learn how advancing software technologies are impacting commercial, space and military applications. For more information, go to http://www.se2conference.com

MARS Tennis Club is seeking new members for 2005

The MARS Tennis Club's 2005 Membership Drive is under way. An open house will be held from 9 a.m. to 2 p.m. Saturday at the MTC tennis courts on Gemini Road. NASA employees, retirees, on-site and off-site contractors, and a limited number of Army and Department of Defense employees are eligible to join. Yearly dues are $25 per individual and $30 per family. League dues are $15 for singles and $15 for doubles team. See "Inside Marshall" for details or call Ronda Moyers at 544-6809.

Entries being accepted for 2005 Software of the Year Award

Entries are being accepted for the 12th Annual NASA Software of the Year Award. This award recognizes NASA team members who develop exceptional software for use by NASA. The award includes the NASA Software Medal certificate and up to $100,000. NASA centers, facilities, major contractors, supporting universities and small businesses may participate. Entry deadline is April 15. For contest rules and submission guidelines, go to http://icb.nasa.gov/

Earth Day class offers continuing education credit

A free continuing education class on environmental sustainability will be held from noon to 2 p.m. April 19 in Bldg. 4316, following the Earth Day ceremony. The class will be taught by Dr. Brian Nattrass and Dr. Mary Nattrass, experts in the field of sustainability. Each participant will earn two continuing education credit hours.

AIAA March meeting is Tuesday

Richard E. Reeves, president and chief executive officer of Biztech, Inc., will speak Tuesday at the monthly meeting of the American Institute of Aeronautics and Astronautics. The meeting will be held at the Holiday Inn Research Park. Dinner begins at 7 p.m. and the cost is $15 for students and $20 for all others. For reservations, call Kevin Higdon at 256-679-3143.

Lawson

Lawson is Shuttle Propulsion Employee for February

Ann Lawson was named February Shuttle Propulsion Employee of the Month. Lawson is the management support assistant for Mike Rudolphi, manager of the Shuttle Propulsion Office. She was recognized for her diligence, initiative and performance.

Advanced Space Propulsion Workshop set for April 7-8

The 16th Annual NASA Advanced Space Propulsion Workshop is set for April 7-8 at the University of Alabama in Huntsville Bevill Center. This year's workshop will focus on technology readiness levels, relatively far-term space propulsion and power concepts and technologies that hold the promise of enabling ambitious robotic and human exploration missions for the 21st century. Register for the workshop at http://www.uah.edu/research/PRC/ASPW

World Year of Physics Conference is set for April 5-7 in Huntsville

The World Year of Physics Conference will be held April 5-7 at the Von Braun Center in Huntsville. Thirteen speakers have been invited, including two Nobel Laureates. For more information, go to http://www.wyp-ptm.org.

Classified Ads

Miscellaneous

Sofa bed, $100; dining room suite, $700; large desk, $20; sofa table, $50. 534-0939

Marquise solitaire, .50 carat, clear S13; marquise wrap, 4-stones, .33 carat, S12, size 7, $800. 828-4334

2000 295 Stratos Pro-Elite, 200 Johnson, tandem trailer, gps, 12/24, $15,999. 233-3407

Hotpoint electric stove, $50. 461-9494

Whirlpool Estate Series refrigerator, white, bottom freezer, 19.1 cu. ft., $200. 345-4255

Breeze 510 wheelchair. 722-8086 after 4 p.m.

Gateway computer, 15" monitor, printer, accessories, $250. 256-586-7424

Two Nikon 8008s 35mm SLR w/MF-21 data backs, $300 each, $550 for both. 256-656-2965

AKC German Shepherd puppies, champion line, 3 females, 5-months, black/tan, vet checked, shots, $350. 256-694-5912

Revolver, blue steel, 357 magnum w/fully adjustable target sights, and checkered Walnut grips, $190. 882-6947/Derek

Diamond solitaire ring, .25 carat, $100; diamond cluster, heart-shaped ring, $125. 683-1279

1993 Shasta 21' pull behind camper w/awning, sleeps 5, $5,000. 256-694-0501

John Deere SST16 riding lawn mower, 25 hrs. usage, bagger & mulching kit, $2,500. 214-0110

Ducane propane gas-grill w/stainless steel cart w/wheels, side-order cooker, rotisserie & rotisserie burner, $400. 256-880-2015

Computer desk/hutch, natural wood color, pull-out keyboard, cork board backdrop, $125. 325-9264

Kenmore refrigerator, $600; Sears treadmill, $250; chaise pool lounger, $70; wood rockers, $75 each. 468-5522

1994 Murray riding lawn mower, 12.5HP gasoline engine, 30" mulching blade, $500. 882-2369

1996 Sea Doo XP, many extras, consider trade for ATV. 256-572-1197

Wood/carved Belgium antiques: 2 hutches, 5 chairs, bed, table & chairs, two wood/barley twist benches. 880-6655

Oak entertainment center, 52"Wx52"Hx17"D, $125. 837-5480

Three Goodyear tires, size 225-60R-16, w/5/32" tread depth, $60. 852-5446

Logitech cordless desktop express keyboard & optical mouse, white, new in box, $30. 256-461-0096

Portable grill/ice chest combination, Grill2Go, Fire&Ice by Thermos, new in box. 233-0705

Nikon N90 35mm SLR w/Nikon 35-80mm AF F4.0-5 6D zoom lens, $400. 772-9930

Custom built 4-piece drum set w/Sabian hi-hats and 2 cymbals, drum sticks/stands included, $250. 256-682-1878

Chrome Craft dinette table, 4-chairs, $400; Huntington House sofa, $300; Oak coffee table, $125. 256-852-8750

Master's practice round ticket, April 6, one only, $36 list price. 534-2368

1994 Holiday Rambler Imperial 5th wheel travel trailer, 30' long, 1 slide out, $12,000. 232-8093

Sony Playstation 2, additional controller, 2 memory cards, 5 games, many extras, $200. 256-353-9020

Pecan bedroom suite, king size, 5-piece, $700; pecan framed full-size floor dressing mirror, $125. 256-922-9311

Pool table, 4'x8', slate top, $600. 256-852-8545

Country style Oak table w/4 chairs, $200. 414-403-7676

Flowered patio umbrella, $15. 464-9408

Scooter, red, electric/pull start, lights, storage compartment, new, $200; wedding dress, veil, ivory satin, $100. 776-9165

White lab puppies, no papers, $100 each. 348-5468

Sony Hi-Fi, 4-head vcr/dvd combo player, remote, manual, silver, $75. 864-2417

Full size bedroom suite w/mattress, $100; coffee & end tables, $50; washer & dryer, $100. 520-2802/Ron

Vehicles

1996 850 GLT Volvo, 80k, all-power, multi-cd, black w/gray leather, $7,900. 256-536-8480

1994 Ford E-150 conversion van, leather, quad captain's seating, entertainment system, rear a/c, pw/pdl, $3,900. 256-520-8088

2003 Honda Odyssey EX, leather, redrock pearl exterior, 54k miles, $21,000. 256-508-6989

1997 BMW 74-iL, 135k miles, dark green, tan leather, loaded, $12,500. 536-8692

2001 Chevrolet 1500HD crewcab, 4x4, 6.0/v8, leather, all options, steprails, Tonneau, 64k miles, $22,900. 256-498-6568

1998 Ford Ranger XLT, 4-cyl., 5-speed, 80k miles, $4,950 firm. 256-753-2278

1999 Chevrolet Silverado LS, 4.8/v8, 90k miles, $9,500. 256-302-3064

2000 F250 4x4 crewcab Lariat, v10, auto, white/tan leather, 91k miles, $19,000. 725-3798

1993 Nissan Quest, 201k miles, leather, automatic, v6, loaded, transmission problems, $1,500/negotiable. 851-8447

1966 Ford Mustang, body & mechanical parts good, ready for restoration/modification, $2,000. 256-603-5807

1995 Dodge Caravan Grand, 5-door, $4,500. 256-679-5723

1999 Ford Explorer, 4x4, 74.9k miles, red, $8,299. 353-3229

2003 Nissan Pathfinder, v6, 2-wheel drive; automatic, 4-door 22k miles, leather, cd, tow, silver, $23,500. 256-880-3337

2001 Mustang, 6 cyl., automatic, all-power, cd, 70k miles, $4,500. 256-586-7013

2001 Nissan Xterra XE, v6, automatic, power, cruise, cd, green, 64k miles, $10,900. 430-2856

1998 BMW 740IL, hunter green, tan leather interior, 101k miles, new tires, $16,000. 682-0888

1975 Honda CB 500T motorcycle, $2,495. 508-4379/evenings

2002 Mercedes-Benz C230 coupe Kompressor, automatic, 32k miles, moonroof, warranty, $17,500. 883-2172

2003 GMC Sonoma truck, under warranty, 5-speed, 23k miles, $8,500. 679-4198

2000 Mitsubishi Montero Sport Limited, v6, leather, 136.9k miles, garaged, $12,000. 256-653-3240

1994 Lincoln Mark VIII, 220k miles, $1,900. 256-520-3874

1996 Windstar, new motor has 46k miles, $2,300. 828-0631

2000 Mustang, red, all-power options. 3.8L/v6, am/fm/cd. 468-4274

2001 Toyota Tundra, 4wd, black, 94k miles, one-owner, never wrecked, $15,500. 256-233-0362

Wanted

Utility trailer, suitable for riding lawn mower w/50" cutting deck. 684-6541

Used Electrolux vacuum cleaner in good condition. 881-0883

Room mate, 3 bedroom house, 12 miles NW of Gate 9, all utilities included, $400 per month. 864-8474

Reasonably priced newborn to 6 months infant girl's clothes and dresses. 256-565-8340

Toddler car seat. 508-8707

Small riding mower in serviceable condition. 534-5175 after 5 p.m.

Lost

Diamond and sapphire ring. Call 652-6268 if found

Found

U.S. currency and Ladies ring. Call 544-3623 to claim/identify

MARSHALL STAR

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